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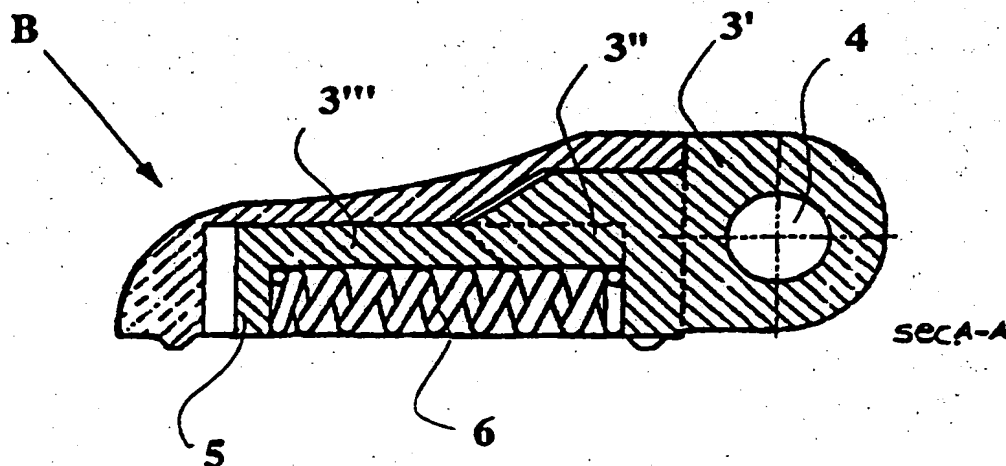
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>6</sup> : <b>G02C 5/22</b>	<b>A1</b>	(11) International Publication Number: <b>WO 97/45</b> (43) International Publication Date: 4 December 1997 (04.12)
(21) International Application Number: <b>PCT/IT97/00108</b> (22) International Filing Date: 13 May 1997 (13.05.97) (30) Priority Data: TV96A000070          31 May 1996 (31.05.96)          IT (71)(72) Applicant and Inventor: <b>MONTAGNER, Luciano</b> [IT/IT]; Viale Italia, 16, I-31040 Segusino (IT). (74) Agent: <b>D'AGOSTINI, Giovanni; D'Agostini Organizzazione,</b> Via G. Giusti, 17, I-33100 Udine (IT).	(81) Designated States: BR, CN, JP, KR, US, European patent BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, NL, PT, SE). Published With international search report.	

(54) Title: IMPROVEMENT OF A DEVICE, PARTICULARLY REDUCED, FOR THE ELASTICIZING OF ONE EAR-PIECE FOR SPECTACLES

## (57) Abstract

Improvement of a bi-elastic device, particularly reduced, for the elasticizing of ear-pieces for spectacles, essentially comprising one small box, combined as finished with the ear-piece by spot-welding and pre-assembled, in whose inside are housed at least two springs, said springs on one side being with their end in abutment on the small box, on the other side being positioned in abutment of the end of a tie-rod, whose shape is substantially "L" like respect to which they are placed adjacent and parallel; while the opposite end of the same tie-rod, being external to the small box, is hingeable to a corresponding small front face provided on the frame of the spectacles.



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DESCRIPTIONIMPROVEMENT OF A DEVICE, PARTICULARLY REDUCED, FOR  
THE ELASTICIZING OF ONE EAR-PIECE FOR SPECTACLES.Technical Field

This invention has for object the improvement of a bi-elastic device, particularly reduced, for the elasticizing of an ear-piece for spectacles. The innovation finds particular even if not exclusive application in the field of the spectacles production and of the metal small parts, not excluding their fittings.

Background Art

It is known that many frames for spectacles are found in prior art. Some of these, provide some devices, made close to the hinging, for allowing the elastic fastening to that part of the frame which is known as front face. Such function, obtained on both sides of the spectacles, on one hand has the advantage of giving a better fitting, because if the ear-pieces exert a lower pressure on the temples, they are more easily enduring by most people, on the other hand they would result more adaptable to the different anatomical shapes of each subject. The firms of the field therefore, are since a long time thus oriented, with the main purpose of finding innovative and often improving solutions, both with regard to the functioning and mainly to the size, when compared to the pre-existing ones.

For example, a traditional elasticized ear-piece, that found a wide consent among the consumers, consists of the European patent application n.79400087.7, in which was described an elastic hinge for spectacles frame, essentially made up of a box, associated sideways to the ear-piece, for containing a tie-rod means coaxial to said box, and in which the end portion of the tie-rod is threaded, on which is screwed a

1 bushing that ensures the positioning of a spring, while on the other  
2 side it is in abutment on the inside of a seat obtained in said box.

3 Again a system, conceptually based on the solution provided by the  
4 previous patent, may consist of the utility model n.181221, having for  
5 object an improved hinge for the articulation to a spectacles frame of  
6 an elastically openable ear-piece, in which it is provided a squared  
7 support inserted in the frame, on which it is inserted a support which  
8 is also squared that makes up a shoulder for the compression of a  
9 spring.

10 Finally, the Italian Patent n. 1 147 198, has for object an ear-piece for  
11 spectacles with elastic hinging, in which the end of the ear-piece  
12 involves an axially holed small block within which is inserted one end  
13 for the connection of the hinge. Continuing with a reduced diameter, it  
14 supports inserted a sharp edge that is fixed inside the borehole while  
15 on the back of this latter is provided a tension helicoidal spring  
16 blocked at the end of the element by a threaded locknut. In such case it  
17 is possible the elastic opening of the ear-piece according to a certain  
18 angle by means of elastic yielding of the hinge-like connection.

19 The drawbacks noticed, in general common in the mentioned solutions,  
20 consist essentially of the excessive complexity of the utilized devices,  
21 which involved also a total oversizing of the device. Furthermore,  
22 notwithstanding they perform their functions perfectly, they  
23 determine many problems during the manufacturing phases, on one  
24 side for what concerns the realization of the many precision  
25 components, on the other during their assembling, at the end  
26 influencing in considerable measure times and costs. Main purpose of  
27 the present firms of the field, has been therefore the obtainment of the  
28 elasticizing devices of the ear-piece, that, even being more restrained

1 in their size, offer a good functionality aiming at the same time to  
2 reducing the components, facilitating the assembling and diminishing  
3 the costs.

4 In the panorama of the recent devices, in line with the above  
5 mentioned principles, and that are more or less effectively proposed on  
6 the market, there is a solution in which the articulation is all one with  
7 the sliding body for the containing of an elasticizing spring of the ear-  
8 piece. In more detail said body, has a square cross section, in which  
9 longitudinally has been removed some material from one part to the  
10 other, up to obtain opposite thin sheets which define the guide seat,  
11 making up the containing walls of a spring. On one side, the spring is  
12 placed in abutment on said seat, while on the other, it is fastened to a  
13 tooth which protrudes respect to the profile defined by the sliding  
14 body. Of the device considered, is part also a half-hull, opened on one  
15 side to be then associated to an ear-piece, and on the inside of which is  
16 inserted the sliding body complete of the spring, turning the tooth on  
17 the longitudinal surface in which is obtained a stop reference. Being  
18 in a traction condition, the articulation obliges the body to slide on the  
19 inside of the half-hull maintaining the tooth constantly gripping  
20 along the base of said half-hull, up to compress the spring, therefore  
21 recalling elastically the articulation itself.

22 It is also very common the condition of fastening to said box pre-  
23 assembled on the end of the ear-piece, the elastic yielding group,  
24 essentially consisting of an articulation on which is screwed a tie-rod  
25 coaxial to a spring, fastened on the opposite side by a suitable bushing.

26 As a consequence, it is possible to notice at least two drawbacks, on one  
27 side, the need for an adequate size, which influences the weight of the  
28 structure, aesthetics not excluded, on the other, the use of screw means

1 involves considerable assembling times, and therefore also  
2 considerable costs. For some ear-pieces, considered valuable, the system  
3 is still valid, as seen by their wide use, but for the others, directed to a  
4 wider public, the device would not be anymore convenient, because it  
5 should suit costs of the frame definitely more contained. The  
6 continuous research in the field, in recent times, was therefore  
7 directed towards alternative devices, designed for being promoted in a  
8 great amount and mainly able to obviate the use of the spring passing  
9 the box for the fastening of the elastic yielding group.  
10 It is known also the French Patent n. 2 517 080. More in detail is again  
11 described a hinge for spectacles frame, in which the metal core is all  
12 one with the articulation hinged to the front face. More in detail, the  
13 core is placed, passing from one side to the other, coaxial to a box,  
14 which near to one end provides an housing, able to contain an  
15 helicoidal compression spring. This latter, on one side is positioned in  
16 abutment on the annular edges obtained through a working internal to  
17 said box, on the other side is being positioned on the end, partially  
18 inserted inside the box and which covers the end of said core. The  
19 effect obtained by opening the ear-piece consists in visualizing the  
20 coaxial sliding of the end with respect to the box containing the device.  
21 The drawbacks of this latter solution consist of the fact that are still  
22 required some complex components, which would make particularly  
23 difficult the manufacturing and assembling, not excluded some  
24 manufacturing costs which would affect considerably the finished  
25 product.  
26 Always in prior art, are known other improved elastic yielding devices,  
27 which derive more or less from the previously described solutions, and  
28 in which are anyway observable some problems related to the large

1 size of the articulation.

2 The fact of being particularly bulky, with regard to the elasticizing  
3 device, on one hand is unpleasant to see, on the other it is with no  
4 doubt limiting, because the ear-piece shape conditions its application.  
5 Other negative aspects, commonly noticeable in the mentioned  
6 solutions, regard the fact that it is no possible to combine the already  
7 finished device directly with the ear-piece, thus involving rather long  
8 assembling times. Finally, the traditional ear-pieces have a tie-rod  
9 which, because of its shape, allows an excessive slack, being inclined to  
10 a torsion, not much liked by the consumer. Purpose of this invention is  
11 to obviate the mentioned drawbacks.

12

13 A proposal of the same applicant consisted of a device, particularly  
14 reduced, for the elasticizing of an ear-piece for spectacles, essentially  
15 comprising a small box, combined as finished with the ear-piece by  
16 spot-welding and pre-assembled, in whose inside are housed two  
17 springs, said springs, on one side being with their end in abutment on  
18 the bottom of the small box, on the other side being placed in abutment  
19 of the end of a tie-rod, with respect to which they are placed one for  
20 each side; and in which the shape of the tie-rod is substantially "T" like  
21 having the opposite end, provided with a suitable hole, hingeable to a  
22 corresponding small front face provided on the frame of the spectacles.  
23 Another purpose of this invention is that of improving the previous  
24 solution.

25 This and other purposes are reached with the present invention  
26 according to the characteristics to be found in the enclosed claims,  
27 solving the mentioned problems by improving a bi-elastic device,  
28 particularly reduced, for the elasticizing of the ear-pieces for

1 spectacles, essentially comprising a small box, combined as finished to  
2 the ear-piece by means of spot-welding and pre-assembled, in whose  
3 inside are housed at least two springs, said springs on one side being  
4 with one end in abutment on the small box, on the other being placed  
5 in abutment of the end of a tie-rod, whose shape is substantially 'L' like  
6 with respect to which they are placed adjacent and parallel, while the  
7 opposite end of the same tie-rod, being external to the small box, is  
8 hingeable to a corresponding small front face provided on the frame of  
9 the spectacles.

10 In such way, through a considerable creative contribution whose  
11 effect represents an immediate technical progress, are obtained many  
12 advantages. First of all it is obtained a substantial reduction of the size,  
13 mainly of the length, that besides being a considerable aesthetic  
14 advantage, allows the widening of the range of the tie-rods on which  
15 said device can be used. A second aspect, non less important, is the fact  
16 that because of the particular 'L' like shape of the tie-rod, are avoided  
17 those negative slacks, mainly torsion ones, very common in the linear  
18 mono-elastic tie rods, diminishing the components wearing. For what  
19 concerns the productive aspect, some advantages consist of that the  
20 device is completed before being combined with the ear-piece, and  
21 therefore, combined as finished to this same with a substantial  
22 reduction of manufacturing times and costs.

23 In conclusion, there will be a considerable functionality-price ratio,  
24 making possible the use of the elastic yielding device in a great amount  
25 of spectacles, thus widening the base of the possible consumers.

26 These and other advantages will appear from the following detailed  
27 description of preferred embodiments with the aid of the enclosed  
28 schematic drawings whose manufacturing details are not to be



1 considered as limitative but only as examples.

2 Figure 1. represents a total view and seen from the open side of the  
3 small box, of the main part of an elastic yielding device, to be combined  
4 with a corresponding tie-rod.

5 Figure 2., represents a longitudinal section view of the device of Figure  
6 1., seen respectively along the axis A-A.

7 Figure 3., is a total and partially sectional top view of the device of the  
8 previous figures in its operating conditions.

9 Figures 4. and 5 represent respectively a bottom and side view of the  
10 small box, as a part of the elastic yielding device.

11 Finally, Figures 6 and 7 represent a view of the two sides of a tie-rod  
12 having an end shape of the "L" like type.

13 Referring also to the figures, it can be seen that at least one ear-piece  
14 (A), particularly for spectacles, is elastically yielding for allowing,  
15 when these are worn, the opening of these ear-pieces beyond the  
16 common opening axis, generally perpendicular, with respect to the  
17 frame (D). More in detail, each metal ear-piece (A) of the spectacles,  
18 provides as combined on a flat side, and in correspondence of one end,  
19 an elastic yielding device (B), which interacts with a device part (C),  
20 called small front face, and engaged in turn on the spectacles frame  
21 (D). The elastic yielding device (B) consists of a small box (1), having  
22 rather contained size, open (1') on the fixing side on the corresponding  
23 ear-piece (A). Along the perimetrical edge of the small box (1), always  
24 on the open side (1'), are provided three coplanar protrusions of  
25 exceeding material (1"), respectively two in the front part and only one  
26 in the back part. Said protrusions or teeth (1"), during a following  
27 cycle of spot welding by electro-welding, melt with the part of the ear-  
28 piece (A) concerned, allowing the definite and steady fastening of the

1 small box (1), and therefore of the device (B). A second characteristic,  
2 always of the small box (1), is that of providing a longitudinal opening  
3 (2) which concerns its edge in correspondence of the front part, and  
4 which requires some perpendicular walls (2') respect to a base surface  
5 (2''). The purpose of said opening (2), is that of allowing the axial guide  
6 of a tie-rod (3), said tie-rod being in part housed inside of the small box  
7 (1), and in part protruding from this latter through a flat surface (3')  
8 for being hinged to the small front face (C) of the spectacles (D). The  
9 flat surface (3') of the tie-rod (3) provides the rounded edge and a  
10 central hole (4) for the hinging of the group era-piece (A) - device  
11 (B), to the small front face (C), while on the opposite side, the portion of  
12 tie-rod which protrudes inside of the device (B) includes a flat surface  
13 (3'') turned of 90° respect to the front part (3'), which is followed by  
14 an end section or wing (5) perpendicularly folded respect to the flat  
15 surface (3''). This therefore recalls a typical "L" like shape. An  
16 intermediate part of the tie-rod (3) consists of the portion (3'''), which  
17 provides an oblique section which, together with the sloping surface  
18 (1''') of the small box (1) the end-stroke of the tie-rod (3).  
19 Substantially the portion (3'''), is a positive copy of the shape of the  
20 guide seat (2) obtained in the small box (1), allowing in a non-  
21 operating condition, to keep the springs slightly operating, thus  
22 avoiding any slack mainly of the tie-rod (3). In phase of assembling, it  
23 is thus possible to insert into the small box (1), first the tie-rod (3) and  
24 then the springs (6), or also both of these latter together, which by  
25 forcing slightly into the housing will result pre-charged.  
26 The wing (5) is obtained monolithically from the tie-rod (3), allowing  
27 to define a lateral housing, inside of which, in contact with the side  
28 (3''') is housed a couple of helicoidal springs (6) parallel and adjacent.

1 Even more in detail, both springs (6) are placed with one end (6') in  
2 abutment on the bottom of the front part of the small box (1), while  
3 with the opposite end (6'') are in abutment on the corresponding wing  
4 (5). By exerting an axial traction of the tie-rod (3), condition which is  
5 like the opening beyond the usual opening angle of the ear-piece (A),  
6 is obtained a compression of both wings (6), which in this way contrast  
7 its action. As a consequence, the ear-piece (A) hinged to a  
8 corresponding front face (C) will yield elastically, respect to the front  
9 of the frame (D), pulling the tie-rod (3) and contemporaneously  
10 compressing the springs (6), internally pushed towards the shoulder of  
11 the front part of the small box (1).  
12 Thus, the natural extension of the springs (6), allows to the spectacles,  
13 first to be properly and softly worn by modulating the pressure exerted  
14 by the ear-pieces on the temples, and then, when no more used, the  
15 return to a static condition.

1

Claims

2 1. Improvement of a bi-elastic device, particularly reduced, for the  
3 elasticizing of the ear-pieces for spectacles, essentially comprising a  
4 small box (1), combined as finished with the ear-piece (A) by spot-  
5 welding and pre-assembled, inside of which are previously housed at  
6 least two springs (6), said springs on one side being with their end in  
7 abutment on the small box (1), and characterized in that the springs (6)  
8 on the opposite side (6'') are placed in abutment of the end of a tie-rod  
9 (3) which is substantially "L" like shaped.

10 2. Improvement, according to claim 1, characterized in that the springs  
11 (6) respect to the tie-rod (3), are placed adjacent and parallel.

12 3. Improvement, according to claims 1 and 2, characterized in that a tie-  
13 rod (3), partially housed inside of the small box (1), and partially  
14 protruding from this latter, consists of:

15 - a front part which is a surface (3') to be hinged to a small front face  
16 (C) of the spectacles (D), which provides a central hole (4) for the  
17 hinging of the group ear-piece (A) - device (B), to the small front face  
18 (C);

19 - an intermediate part consisting of the portion (3''), which provides  
20 an oblique section which, together with the sloping surface (1''') of  
21 the small box (1), is the end-stroke of the tie-rod (3);

22 - and a back part which protrudes inside of the device (B) comprising a  
23 straight surface (3'''), which is followed by an end section (5)  
24 perpendicularly folded respect to said surface (3''')

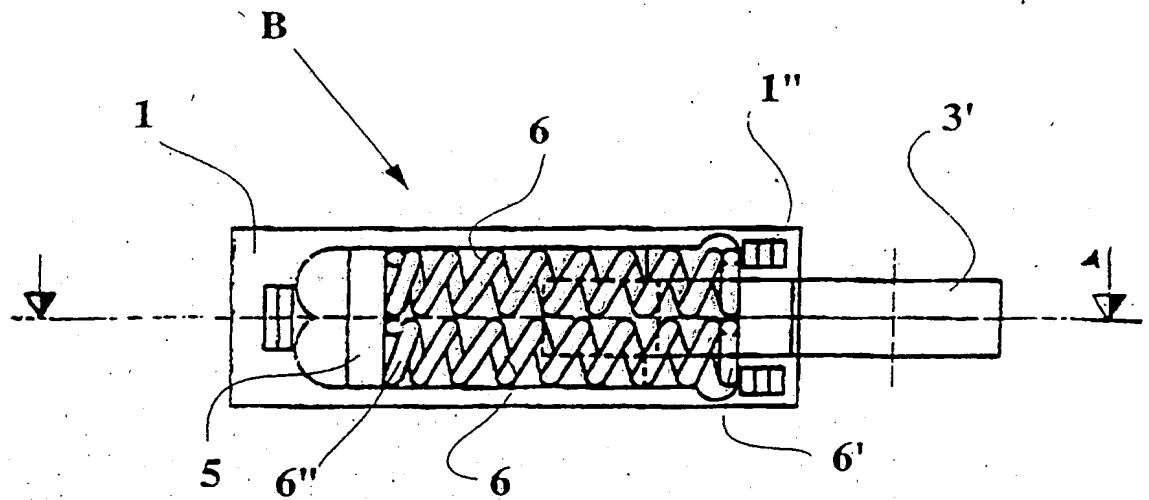
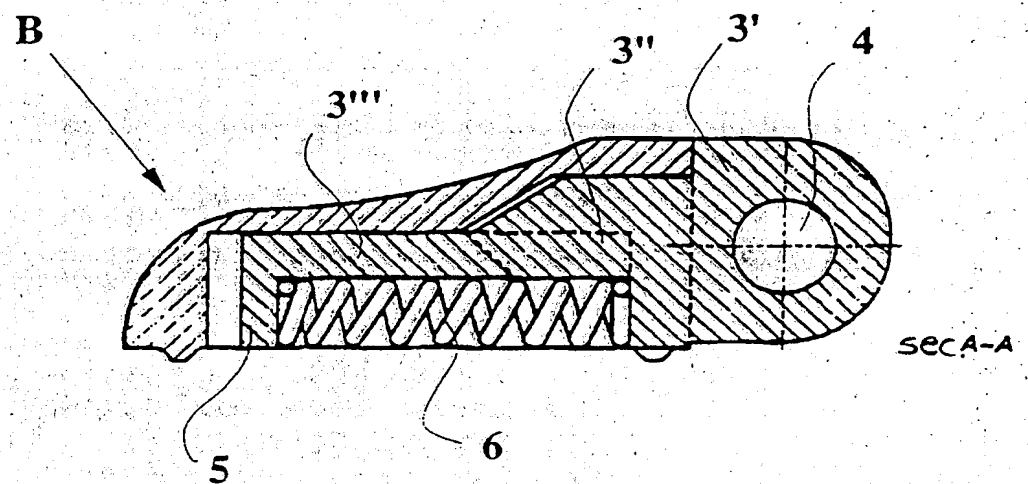
25 4. Improvement, according to previous claims, characterized in that the  
26 back part which protrudes inside of the device (B) includes a flat  
27 surface (3''') turned of 90° respect to the front part (3'), which is  
28 followed by an end section or wing (5) perpendicularly folded respect

1 to the flat surface (3''').

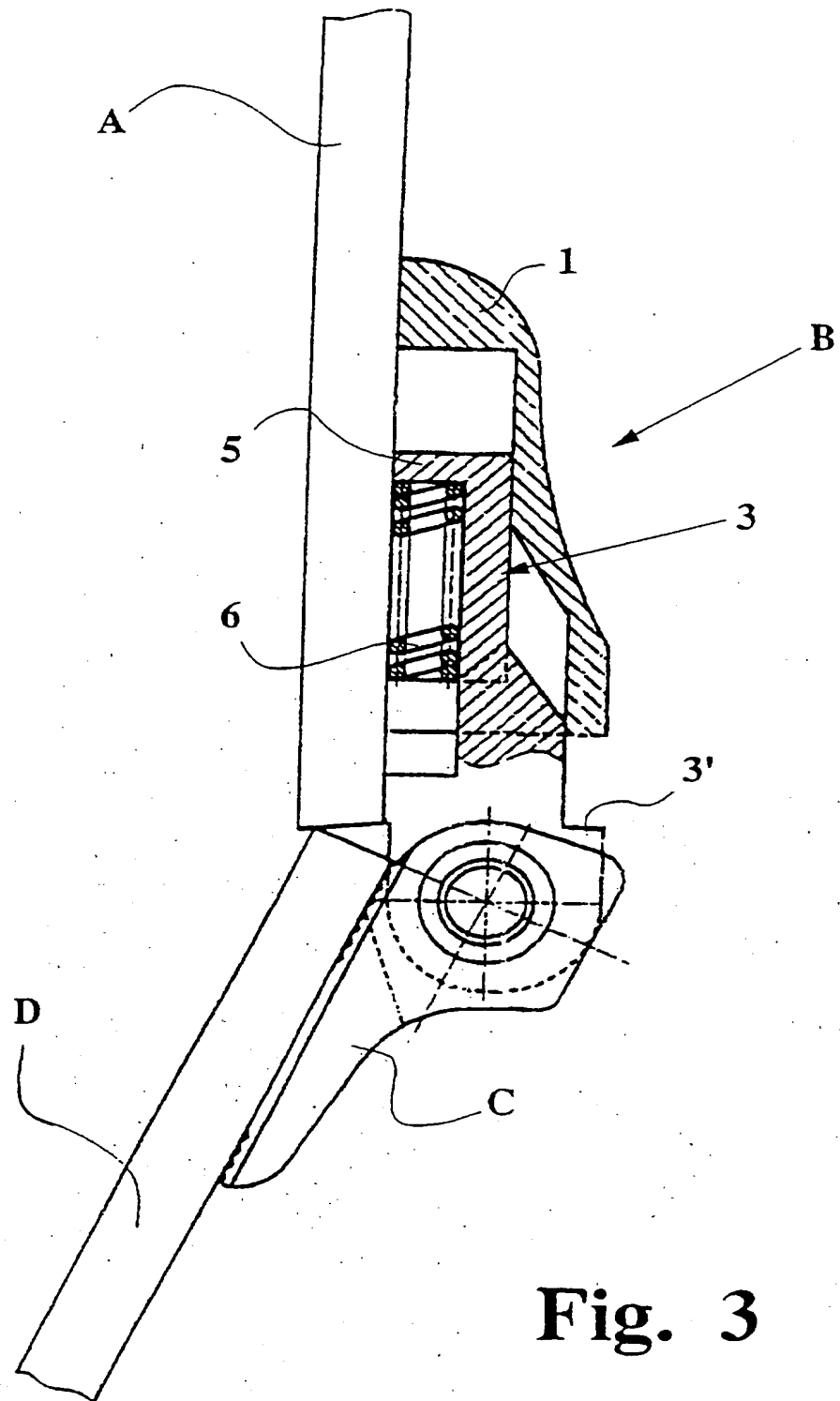
2 5. Improvement, according to previous claims, characterized in that  
3 the portion (3'') is the positive copy of the shape of the guide (2)  
4 obtained inside the small box (1).

5 6- Improvement, according to previous claims, characterized in that the  
6 small box (1) has a longitudinal opening (2) which concerns its edge in  
7 correspondence of the front part, and which provides some  
8 perpendicular walls (2') respect to a base surface (2'')

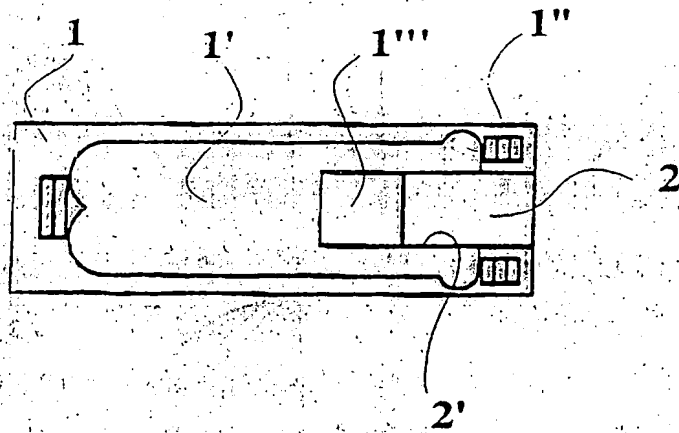
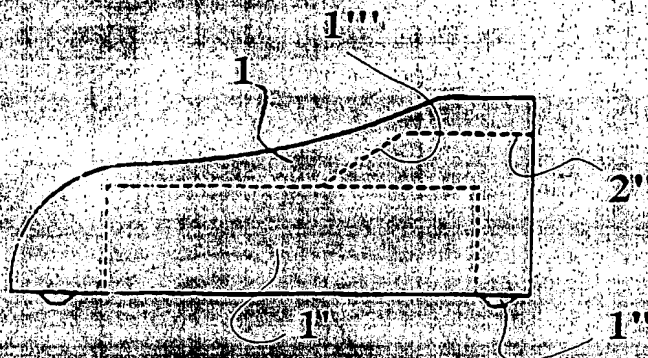
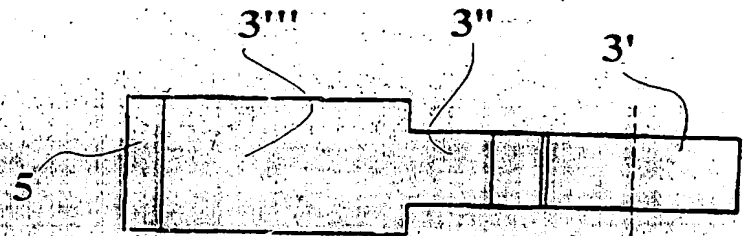
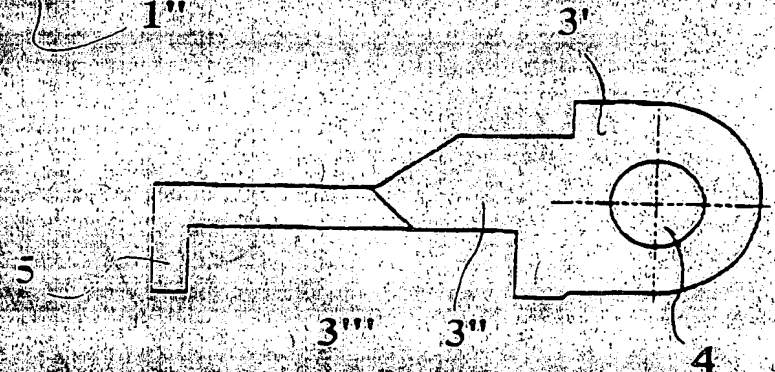
9 7. Improvement, according to previous claims, characterized in that the  
10 wing (5) is monolithically obtained with the tie-rod (3), defining a  
11 lateral housing, inside of which, in contact with the side (3''') are  
12 housed a couple of helicoidal parallel and adjacent springs (6).

**Fig. 1****Fig. 2**

2/3

**Fig. 3**

3/3

**Fig. 4****Fig. 6****Fig. 5****Fig. 7**



## INTERNATIONAL SEARCH REPORT

International Application No

PCT/IT 97/00108

A. CLASSIFICATION OF SUBJECT MATTER  
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According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 29 48 113 A (MENRAD FERDINAND FA) 4 June 1981 see page 3 - page 4	1
A	FR 2 097 211 A (R. GIROD) 3 March 1972 see page 1 - page 2, line 4	1
A	EP 0 462 936 A (NATIONALE SA) 27 December 1991 see column 1, line 16 - column 2, line 45	1
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Information on patent family members

International Application No

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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FR 2097211 A	03-03-72	NONE	
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EP 0239011 A	30-09-87	NONE	

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